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ABSTRACT

Twenty 4-year-olds were observed during free play at excellent, moderate, and poor quality day care centers. The children were observed again at eight years as they participated in triadic play sessions. Parental, peer, and self-ratings were also obtained. Significant continuity between the children's day care experiences and their functioning at eight years was found. Time spent in positive interactions with adults at four years (which was more common in excellent quality programs) was positively related to ratings of empathy, social competence, and social acceptance at eight years, while time spent in unoccupied behaviors at four years (which was more common in poorer quality programs) was negatively associated with ratings of empathy, conflict negotiation, and social competence at eight years. Significant differences in the children at eight years were associated with prior day care experience. (Author/PCB)

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A Follow-Up Study of Children in Excellent, Moderate, and Poor
Quality Day Care

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Abstract

20 4-year-olds were observed during free play at excellent, moderate, and poor quality day care centers. The children were observed again at 8 years as they participated in triadic play sessions. Parental, peer, and self ratings were also obtained. Significant continuity between the children's day care experiences and their functioning at eight years was found. Time spent in positive interactions with adults at four years (which was more common in excellent quality programs) was positively related to ratings of empathy, social competence, and social acceptance at eight years, while time spent in unoccupied behaviors at 4 years (which was more common in poorer quality programs) was negatively associated with ratings of empathy, conflict negotiation, and social competence at 8 years. Significant differences in the children at eight years were associated with prior day care experience. Compared to children who had been in better quality care, children who had been in poor quality care received more "shy" peer nominations, rated themselves more negatively in terms of their general and cognitive abilities, and were rated by their parents as having poorer peer relations. On most variables, children who had been in moderate quality care were similar to excellent care children, but they did receive more negative, "fights a lot" peer nominations. Implications and limitations of these results are discussed.

A Follow-up Study of Children in Excellent, Moderate, and Poor Quality Day Care

Recent investigations have focused on the effects of day care quality on children's social and cognitive development. In one study, McCartney (1984) contrasted preschoolers who attended eight Bermudan day care centers which varied widely in quality, with day care quality being defined in terms of physical facilities, types of activities, and teachers' language to the children. McCartney found that children who were in poorer quality day care had significantly poorer language development than those children in higher quality programs. Using the same sample, Phillips, McCartney, and Scarr (in press) found social competence to be similarly affected by day care quality.

Howes and Olenick (1986) also reported more problematic development in toddlers who attended poorer quality day care, when quality was defined in terms of adult-child ratios, level of teacher training, and staff turnover. Children in poor quality programs were less compliant and less likely to use self-regulatory behaviors. Howes and Olenick also found differences in the teachers' behaviors with the children. Teachers in the poor quality programs were less invested in the children and were less involved in eliciting compliance than were teachers in the higher quality programs.

In one of the largest projects to date, the National Day care Study (Ruopp, Travers, Glantz, & Coelen, 1979) found that class size exerted significant effects on day care children.

Preschoolers who were in smaller classes had more active teacher involvement and spent less time wandering aimlessly around the classroom than did children who were in larger classes. Children who were in smaller classes performed better on tests of kindergarten and first grade readiness. Level of teacher training also affected the children. Preschoolers who had better trained teachers were more cooperative towards adults and more persistent on assigned tasks. They performed better on a standardized preschool inventory.

From these previous examinations, it is apparent that children have different experiences in higher and lower quality day care programs. Furthermore, it appears that children's development is affected, at least contemporaneously, by these experiences. There is, however, an important issue which is not systematically examined in these studies, namely longer term effects of participating in varying quality day care programs. It may be that negative effects associated with poorer quality day care are short-lived and children who have been in poor quality care bounce back from this experience. Alternatively, experience in poor quality day care may have longer term negative repercussions on children.

The purpose of the current study was to test these two possibilities by examining longitudinally children who had been in poor quality care. For comparison, the current study also followed children who had been in moderate and high quality day care programs. Although some longitudinal studies of exemplary intervention projects have been published (Consortium for

Longitudinal Studies, 1983; Lazar, Darlington, Murray, Royce, & Snipper, 1982), little is known about the long term effects of day care on children, especially day care programs which vary widely in quality.

To this end, a follow-up study of children who had participated in varying quality day care programs was conducted. In our initial investigation (Vandell & Powers, 1983), we found that children had very different day care experiences. Children in excellent quality centers were more likely to have positive interactions with their teachers, while children in poor and moderate quality programs spent more time in unoccupied behaviors and in solitary play. At that time, we speculated that these differential experiences could have long term consequences for children. We predicted that the lower level of adult-child interaction in the poorer quality programs would result in greater problems related to social and intellectual competencies. We also suspected that more time spent in unoccupied behaviors would be associated with negative developmental outcomes. Consequently, to test for these possible long term effects of varying quality day care, we re-examined the children four years after the initial observations, when the children were eight-years-old.

Method

Subjects

Twenty (10 boys, 10 girls) of the 55 white, middle class children from the initial study were located and their parents agreed to their participation in the follow-up study. The

children's mean age was 51 months at the initial observation and 100 months at the follow-up observation. At the initial observation, all children were from maritally intact families. Four years later, the backgrounds of the children continued to be similar on many dimensions including the ages in which the children began child care and their current after school arrangements (see Table 1). The distributions of children who had moved away, who could not be located, and whose parents refused to participate in the study were similar across the three levels of day care quality. There was a higher incidence of remarriage and divorce in the excellent care group, but this difference should work against the hypothesis of these children performing better at age eight years.

Insert Table 1 about here

Description of the Day Care Centers

During 1980-81, information on 16 area day care centers was collected. Questionnaires and on-the-spot observations were used to determine (1) the number of children and age of children at the center, (2) the number of teachers, (3) the adult-child ratio, (4) the educational level of the staff, (5) the square footage per child, and (6) the number, condition, and availability of toys. From these observations, six centers representing three types of day care were selected for further study.

Two centers were designated as excellent quality programs. These centers were university laboratory programs with low adult-

child ratios ($M = 1:5$), abundant materials readily accessible to the children, teachers with at least bachelor's degrees in child development or early education, and ample space for each child ($M = 60$ sq ft per child). Two centers designated at moderate quality programs were characterized by ratios within the state guidelines ($M = 1:14$), good to excellent materials, and less space per child ($M = 39.6$) than the excellent programs. Staff education varied in the two moderate programs. In one center, teachers had college degrees in child development related fields. In the other moderate program, the teachers had some college, but no degrees. The two poor quality programs were lacking in the facilities and features of the other programs. They had high adult-child ratios ($1:24$), poor to good materials, and less well-trained teachers. Teachers were only required to be 18 years old and none had attended college. Square footage varied in the programs with one having ample space (54 sq ft per child and the other being very crowded (23 sq ft per child). It is interesting to note that tuition in the six programs was similar, one of the high quality programs charged the lowest tuition and one moderate and one poor program charged the highest tuitions.

Procedure

Initial observations. As four-year-olds, each child was observed in a randomly determined order for 16 minutes in his or her day care center during unstructured indoor free play. Behaviors were observed for 20 second intervals and recorded for 15 second intervals. Procedures and results from this phase of the project are outlined in some detail by Vandell and George (1983). The

following variables were extracted from the initial observations:

Positive interactions with peers. The child a) positively touched, b) comforted, c) gave toys to, d) shared toys with, accepted toys from, f) joined in play with, or g) talked to a peer. Each of these acts was coded separated and combined to give the overall frequency of positive behavior with peers.

Negative interactions with peers. The child hit, kicked, pushed, or acted negatively toward a peer, or directed negative vocalizations to a peer. Negative behavior and vocalizations were coded separately and combined for an overall frequency of negative interactions with peers.

Positive interactions with adults. This category was coded similarly to positive interactions with peers, the only difference being the partner.

Negative interactions with adults. This category was coded as were negative interactions with peers, the only difference being the partner.

Solitary play. The child was engaged in a nonverbal activity with an object and showed little interest in other people for at least 15 seconds.

Unoccupied behavior. The child was not engaged in any activity beyond sitting alone or wandering around the room for at least 15 consecutive seconds.

Follow-up observations. At eight years, a variety of procedures was completed. First, children were videotaped for 45 minutes during triadic peer interaction in a laboratory play room. The play room had one way glass on the upper half of two

opposite walls of one way glass. Videocameras were placed behind the opposite walls. A special effects generator enabled a split screen composite picture to be composed.

Triads were composed of one child from each day care quality group. When this was not feasible because of scheduling problems, other eight year olds from the community were used to complete a triad. In no instances were triads composed of two children from the same quality day care background nor did any triad members know one another before the play session.

The triads participated in four separate tasks developed by Sitterlee (1984). After giving the instructions for each task, the experimenter would leave the play room and return after the specified time to give the next set of instructions. The tasks were

a) a cooperative task in which the children were asked to work together to build a lego model like one on a table in the play room. This procedure was 15 minutes long.

b) a 15 minute free play period in which the children were told that they could play with any of the materials in the room. Materials included a dart board, board games, legos, craft materials, nerf balls, etc.

c) a competitive task in which the children were shown how to operate a Labyrinth game. (The Labyrinth game is a box with holes drilled along various pathways. The object of the game is to have a marble travel from the beginning of the maze to the end of the maze without falling in one of the holes.) The children were told that whoever went the

fartherest on the maze would win a prize. They are also told that they could decide how much they wanted to practice on two other mazes before having their contest. This task was ten minutes in length. After 5 minutes the children were given a warning that they had only five more minutes. When the experimenter returned to the play room, she asked the children who won the prize. If the children could not agree, then no prize was awarded.

d) a conflict resolution task in which the children were given a container of coins (1 quarter, 3 nickels, and 3 pennies). The children were asked to divide the money between themselves. After 5 minutes, the experimenter would return to the room and ask the children if they reached a decision. If the children could not reach an agreement, then the money was not given to any of them.

While the children were playing together, the mothers individually completed a questionnaire outlining demographic characteristics of the family as well as their child's child care history. In addition, the mothers completed a 28-item scale (Santrock & Warshak, 1979) in which they rated their child using five-point scales. These items are outlined in Table 2. Summary scores for peer relations, adult-child relations, work-study skills, and emotional well-being were computed by obtaining the mean for the items composing each cluster.

Insert Table 2 about here

After completing the triadic play session, each child was

individually administered Harter's Perceived Competence Scale. This 28-item scale reflects children's evaluations of their own general, athletic, social, and cognitive competencies.

Finally, each child was interviewed individually and asked to nominate which of the triad members best fit the following descriptions:

Cooperative -- Here is someone who is really good to have as part of your group because this person is agreeable and cooperative. This person pitches in, shares, and gives everyone a turn.

Disruptive -- This person has a way of upsetting everything when he (or she) gets into a group. This person doesn't share and tries to get everyone to do things their way.

Shy -- This person acts very shy with other kids. It's hard to get to know this person.

Starts Fights -- This person starts fights. They say mean things to other kids, or push them or hit them.

Leader -- This person gets chosen by others as the leader. Other people like to have this person in charge.

Coding Procedures

The triadic play sessions were coded using a checklist that recorded which of the following behaviors occurred during 15-sec intervals: friendly interactions - an ongoing positive or neutral exchange between two or more children; unfriendly interactions - an ongoing exchange of negative behaviors including sarcasm, negative actions, etc. ; solitary play - whenever a child is playing with objects and not communicating

in any way with his peers. This play can not be similar to what another child is doing on at the same time.

In addition, a different coder observed the videocassettes and rated each child at the conclusion of the triadic play session. Five point scales were used to assess each child on the following dimensions: (1) positive affect - the degree with which positive emotions were expressed in the child's interactions, (2) impulsivity - the degree to which the child was able to delay gratification of needs or to which s/he acts impulsively, (3) cooperation - the degree to which the child worked with others towards a common goal, (4) reaction to frustration - the degree to which the child reacted to frustration, conflict with others, and/or emotionally arousing problem situations, (5) empathy - the child's overall sensitivity to, awareness of, and understanding of others' feelings, (6) social acceptance - the degree to which a child was sought out or liked by others, (7) self esteem - the degree to which a child projected confidence, feelings of capability, or worth, (8) ability to negotiate conflict - the degree to which a child was able to negotiate effectively or resolve potentially problematic situations.

The checklist and ratings were completed by observers who were not aware of the children's prior day care history.

Inter-Observer Reliability

Inter-observer agreement for the checklist and the rating scale was determined by having two coders provide independent assessments on a random selection of 35% of the children. Exact agreement for the ratings was as follows: positive affect (71%),

reaction to frustration (71%), impulsivity (86%), cooperation (86%), empathy (71%), social acceptance (71%), self-esteem (71%), and ability to negotiate conflict (71%). If a one point deviation was allowed, then 100% agreement was obtained for all variables.

Agreement on the checklist was calculated as the proportion of 15-sec observation frames in which both observers noted a behavior over the number of observation frames in which at least one of the observers noted the behavior occurring. Inter-observer agreement was .91 for friendly conversations, .75 for unfriendly conversations, and .87 for solitary play.

Results

Relations between the daycare observations and the children's functioning four years later.

The first question to be addressed was whether there were relations between observations of the children at four years and the children's functioning four years later. For these analyses, the children's free play activities at four years were correlated with the assessments of the children at eight years.

Significant relations were found between the two ages. Those children who had more positive interactions with adults when they were in day care were rated, during the triadic play sessions, as being more socially competent, $r(18) = .57$, $p < .02$, peer accepted, $r(18) = .65$, $p < .01$, empathic, $r(18) = .61$, $p < .008$, capable of negotiating conflicts, $r(18) = .49$, $p < .04$, and capable of handling frustration, $r(18) = .48$, $p < .05$. Unoccupied behaviors at age four years were negatively correlated

with the eight year laboratory ratings of social competence, $r(18) = -.49$, $p < .04$, peer acceptance, $r(18) = -.52$, $p < .03$, ability to negotiate conflict, $r(18) = -.51$, and reaction to frustration, $r(18) = -.57$, $p < .01$. In addition, negative peer interactions at age four years was negatively correlated with the observers' ratings of the children's self esteem, $r(18) = -.499$, $p < .04$, such that those children with more negative peer interactions at four years received lower self esteem ratings by the observers at age eight years.

Surprisingly, the relation between the Harter measures and the four year old observations was in the opposite direction. Those children who spent more time in negative peer interactions at four years rated themselves more positively socially $r(18) = .478$, $p < .04$, and physically, $r(18) = .485$, $p < .03$. No significant correlations were apparent between the four year old observations and the subsequent parental reports.

Comparisons of the Children's Ratings by Parents, Observers, and Self-Evaluations

A second question was whether there were differences in the observers', parents' and self reports associated with the children's child care histories. 3-way (quality of child care) MANOVAs were conducted on these three clusters of variables. 3-way ANOVAs and Duncan post hoc analyses were conducted when significant MANOVAs were obtained.

As shown in Table 3, significant differences associated with

Insert Table 3 about here

quality of day care experience were found for the parental ratings of the children, $F(8, 28) = 2.60, p < .03$, and the children's ratings of themselves, $F(8, 28) = 2.59, p < .03$. Children who had been in excellent and moderate quality day care were rated by their parents four years later as having better peer social skills than were those children who had been in poor quality day care, $F(2, 17) = 6.59, p < .01$. The children who had been in poor quality day care also rated themselves more negatively in terms of their cognitive and general competencies. During the triadic play sessions, children from poor quality day care programs spent less time in friendly conversations, $F(2, 17) = 4.52, p < .03$.

The Children's Playgroup Nominations

In the final set of analyses, χ^2 goodness of fit tests were conducted to determine if there were discrepancies in the children's peer nominations made at the conclusion of the play sessions which reflected different child care histories. As shown in Table 4, the children's nominations of who was cooperative, $\chi^2(2) = 16.80, p < .001$, shy, $\chi^2(2) = 117.3, p <$

Insert Table 4 about here

.001, a leader, $\chi^2(2) = 38.97, p < .001$, a person who fights a lot, $\chi^2(2) = 29.40, p < .001$, varied systematically with child care history. Children who had been in excellent quality day care received disproportionately more cooperative and leader

nominations and disproportionately fewer shy nominations, while the children who had been in poor quality day care received disproportionately more shy nominations and fewer leader and fighter nominations. Children who had been in moderate quality care received fewer cooperative and shy nominations and more fights a lot nominations.

Discussion

An important issue facing parents, educators, and psychologists is possible long term effects of attending excellent, moderate, or poor quality day care programs. The results of the current study suggest day care quality is associated with differences seen in the children four years later.

There was considerable evidence of problematic development in children who had attended poor quality day care programs. These children received a disproportionate share of "shy" nominations, a descriptor which has been used for neglected and isolated school aged children (Dodge, 1983; Rubin, 1985). This nomination was consistent with our earlier observations of the children in poor quality care spending more time in unoccupied behaviors or in aimless wandering. In addition, the peer nominations were consistent with the parental ratings. Parents rated their children who had been in poor quality day care as being significantly less competent with peers.

Other comparisons revealed problems in the eight-year-olds' self ratings associated with poor quality day care. The children

from poor quality care rated themselves more negatively on the cognitive and general dimensions of the Harter scale. Because we do not have actual cognitive or academic assessments of the children, we do not know if these self-ratings were accurate; but at the least, they indicated that these children viewed themselves more negatively than did the other children. An important question for subsequent research is whether these negative self-perceptions influence the children's subsequent development (Rubin, 1985).

In many ways, the children who had been in moderate quality care did not seem to be as "at risk" as the children who had been in poor quality day care. The parental reports, observer ratings, and the children's self-reports were all similar to those of children who had been in excellent quality day care. These similarities were reassuring because in our initial observations children's experiences in moderate quality programs were reminiscent of those in poor quality programs. We had feared these children would be more like children who had been in poor quality care, but this was not the case in most variables.

At the same time, there was a potentially problematic area for the moderate care children. They received disproportionately more "fights a lot" peer nominations. Because aggression is a primary marker of rejected school aged children and rejected status has long term stability and negative repercussions (Coie & Kupersmidt, 1983; Dodge, 1983), this nomination is a concern.

Interestingly, the moderate quality care children did not

have more unfriendly or negative interactions during the play sessions. To the contrary, they spent a large share of the session in "friendly" conversations. An important question, not resolved in the current study, is whether these friendly conversations were interpreted by the other children as being "too pushy" or if there were other messages which the peers used in making their "fights a lot" nominations which were not coded in the current study.

The peer nominations pertaining to the children who had been in excellent quality day care should also be noted. Consistent with our hypothesis that these children would have more positive developmental outcomes, excellent quality day care was associated with children receiving disproportionately more cooperative and leader nominations, nominations that parallel the descriptions of popular, socially competent children (Dodge, 1983).

An important issue is why and how day care quality affects the children. Results from the current study suggest the importance of the children's actual activities within the centers. We found significant continuity between children's behavior in the day care centers and their functioning four years later. Four year olds who spent more time in positive interactions with adults were rated as more cooperative, empathic, and competent with peers as eight year olds. They were also better able to handle frustration and to negotiate in conflict situations at eight years. At the same time, significant negative relations were found between the time four year olds spent in unoccupied

behaviors and their eight year old performance. Those four year olds who spent more time in unoccupied behaviors were rated as less competent with peers, as less accepted by peers, and as less capable of negotiating conflict with peers at eight years.

Interestingly, these same variables (positive interactions with adults and unoccupied behaviors) differentiated the four year olds' activities in the varying quality day care centers. As a group, the children who were in excellent quality day care had spent more time in positive interactions with adults and less time in unoccupied behaviors than did the children who were in moderate or poor quality care (Vandell & Powers, 1983).

At the same time, it is important to note that the correlations were apparent across the centers. To the extent (regardless of center quality) that four year olds had positive interactions with adults, more positive outcomes were observed at the eight year observations. Likewise, to the extent (regardless of center quality) that the children engaged in unoccupied behaviors, more negative outcomes occurred. These results, then, suggest that it is the children's individual experiences in the center which are making the difference. Center quality is important because children are more likely to have positive interactions with adults in excellent quality programs, while they are more likely to spend time in aimless wandering in poorer quality programs.

This study has some strengths and limitations which should be explicitly stated. On the positive side, these observations represent a longitudinal investigation of the effects of day care

quality, an area in which woefully little research has been done. Because of its longitudinal component, issues related to continuity of functioning over time could be explored. On the negative side, the sample size in the current study is small (n = 20). Consequently, our results should be regarded as only a first step in documenting long terms effects of varying quality child care. Other, more subtle differences may be detected when larger samples are available.

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Table 1
 Characteristics of Children Who Had Been in Excellent, Moderate,
 and Poor Quality Day Care

Demographics	Excellent	Moderate	Poor
	n = 8	n = 5	n = 7
Sex			
girls	50 (4)	40 (2)	43 (3)
boys	50 (4)	60 (3)	57 (4)
Marital Status			
married	50 (4)	100 (5)	71 (5)
remarried	13 (1)	(0)	14 (1)
divorced	38 (3)	(0)	14 (1)
Age started full time child care			
under 1 year	75 (6)	80 (4)	71 (5)
1 - 3 years	25 (2)	20 (1)	14 (1)
3 - 5 years	(0)	(0)	14 (1)
Current after school care			
returns to mom	13 (1)	(0)	29 (2)
"latchkey"	13 (1)	20 (1)	(0)
day care center	50 (4)	20 (1)	57 (4)
sitter	25 (2)	60 (3)	14 (1)
Reasons for non-participation			
moved out of city/ could not locate	(6)	(9)	(11)
refused	(1)	(4)	(1)
mechanical malfunction	(1)	(1)	(1)

note. Numbers in parentheses are frequencies of cases. Numbers not in parentheses are percentages.

Table 2

Items Included on the Parental Questionnaire

Peer Relationships

- does not tease other children
- initiates peer interaction
- shares toys, games, materials
- plays with peers
- does not threaten peers
- helps peers
- listens when peers speak
- does not kick or hit peers
- accepts peer's initiations
- does not take turns
- does not fight with peers
- does not tatttle
- prefers activities with peers

Work/study skills

- concentrates on assigned tasks
- is alert
- quick at mastering new subjects
- quits working when problems arise
- very organized

Emotional well-being

- open and honest with others
- is not fearful or afraid
- shows interest and participates

content and happy

extroverted

keeps trying in games

Adult-child relationships

is cooperative and compliant

seeks to be near adults

affectionate

easy to discipline

Table 3

Comparisons of Children from Excellent, Moderate, and Poor
Quality Day Care

Variables	Type of Day Care Program			F Value
	Excellent	Moderate	Poor	
Harter Scale (MANOVA)				$F(8,28) = 2.59, p < .03$
Cognitive	22.7	24.6a	18.9b	$F(2,17) = 3.06, p < .07$
Social	18.5a	24.4b	21.4	$F(2,17) = 2.55, p < .10$
Physical	22.7	22.0	21.3	
General	21.9	24.8a	19.4b	
Parent ratings (MANOVA)				$F(8,28) = 2.60, p < .03$
peer skills	4.2a	4.4a	3.9b	$F(2,17) = 6.59, p < .008$
work/study skills	3.7	4.2	3.5	
emotional well being	4.3	4.3	3.9	
adult-child relations	3.8	3.9	3.5	
Observer ratings (MANOVA)				
positive affect	3.8	4.4a	3.0b	$F(2,17) = 2.98, p < .08$
empathy	3.6	2.6	3.7	
social competence	4.0a	3.6	2.9b	$F(2,17) = 2.99, p < .08$
peer acceptance	3.9	2.8	3.7	
reaction to frustration	3.9	4.4	3.3	
conflict negotiation	3.5	2.6	2.7	
self esteem	3.0	2.4	2.9	
Checklist activities				
Friendly interactions	114.6	135.6a	89.4b	$F(2,17) = 4.52, p < .03$
Unfriendly interactions	1.0	1.4	1.6	
Solitary play	31.3	25.4	39.3	

Table 4
Proportion of Peer Nominations by Day Care Quality

		Children receiving the nomination		
		Excellent	Moderate	Poor
Cooperative	(actual) ^a	58.9	11.8	29.4
	(expected) ^b	40.0	25.0	35.0
		$\chi^2(2) = 16.80, p < .001$		
Disruptive	(actual)	31.3	31.3	37.5
	(expected)	40.0	25.0	35.0
		$\chi^2(2) = 3.65, n.s.$		
Shy	(actual)	16.7	0	83.3
	(expected)	36.8	21.1	31.5
		$\chi^2(2) = 117.3, p < .0001$		
Fights a lot	(actual)	36.4	45.5	18.2
	(expected)	41.2	23.5	35.2
		$\chi^2(2) = 29.4, p < .001$		
Leader	(actual)	70.0	20.0	10.0
	(expected)	41.1	23.5	35.3
		$\chi^2(2) = 38.97, p < .001$		

^aThe proportion of children actually receiving this nomination.

^bThe proportion of children who would have been expected to

receive this nomination given the number of children who were observed and the number of nominations which were made.